

Kind of Data	No.	Content of Data
External Standard	Y_1	Total amount of sugar from favorite food
Fuzzy Group	B_1	Awareness of sweet
	B_2	Favorite of sweet
Category Number (Fuzzy or Non-fuzzy Descriptive Variable)	C_1	Believing sweet good for health
	C_2	Regular intake of meal
	C_3	Intake of snacks
	C_4	Intake late-night snack
	C_5	Favorite of vegetable
	C_6	Self-estimation of amount of vegetable intake
	C_7	Regarding sugar good for health
	C_8	Small amount of sugar for cooking
	C_9	Small amount of salt for cooking
	C_{10}	Small amount of <i>miso</i> (soybean paste) for cooking
	C_{11}	Small amount of <i>shoyu</i> (soybean source) for cooking
	C_{12}	Unbalanced diet
	C_{13}	Demand for more snacks
	C_{14}	Relatively desirable tendency of character
	C_{15}	Relatively undesirable tendency of character
	C_{16}	Desirable tendency of physical condition
	C_{17}	Undesirable tendency of physical condition
	C_{18}	Desirable tendency of psychological state
	C_{19}	Undesirable tendency of psychological state
	C_{20}	Frequency of going to private school in a week
	C_{21}	Length of stay in private school
	C_{22}	Frequency of having a cold in a year
	C_{23}	Many dental caries
	C_{24}	A door-key child?
	C_{25}	Control of meal and its time
	C_{26}	Parents' attitude regarding child

Analysis by Quantification Type I

No.	Category weight			Partial correlation coefficient		
	Fuzzy	Partially fuzzy	Non-fuzzy	Fuzzy	Partially fuzzy	Non-fuzzy
C_1	441.58	284.91	239.04	0.66	0.27	0.24
C_2	154.34	152.55	124.02	0.33	0.29	0.38
C_3	-47.11	26.64	-19.79	0.09	0.02	0.07
C_4	257.95	234.01	133.53	0.83	0.67	0.34
C_5	40.57	77.02	126.25	0.09	0.16	0.29
C_6	3.57	-22.21	28.44	0.04	0.13	0.10
C_7	3.75	28.94	-77.54	0.01	0.11	0.29
C_8	202.63	179.86	80.21	0.82	0.62	0.26
C_9	-35.61	-55.76	5.80	0.15	0.21	0.00
C_{10}	-177.52	-83.70	-77.21	0.61	0.30	0.27
C_{11}	46.10	30.52	40.74	0.19	0.12	0.16
C_{12}	330.08	344.04	95.52	0.83	0.75	0.21
C_{13}	-44.93	32.24	-594.15	0.00	-0.01	0.53
C_{14}	-75.37	102.80	-32.48	0.12	0.17	0.12
C_{15}	-177.78	-144.80	50.72	0.34	0.27	0.20
C_{16}	143.31	194.03	67.28	0.35	0.48	0.24
C_{17}	-133.37	-128.65	-18.21	0.21	0.38	0.08
C_{18}	-201.75	-342.83	-62.27	0.58	0.94	0.12
C_{19}	145.43	175.46	118.61	0.48	0.69	0.48
C_{20}	-51.49	-90.00	-2.42	0.25	0.35	0.01
C_{21}	-114.39	-159.85	-46.93	0.39	0.58	0.15
C_{22}	78.03	21.91	60.07	0.33	-0.01	0.20
C_{23}	-70.76	-55.19	-122.92	0.22	0.36	0.55
C_{24}	-79.56	-121.45	24.44	0.18	0.24	0.03
C_{25}	-126.93	-190.78	-59.24	0.34	0.82	0.23
C_{26}	4.68	-10.87	-64.34	-0.10	0.14	0.23

	Coefficient of determination			Partial correlation coefficient		
	Fuzzy	Partially fuzzy	Non-fuzzy	Fuzzy	Partially fuzzy	Non-fuzzy
	0.753	0.745	0.732	0.868	0.863	0.855

Type I Fuzzy Group: Awareness of Sweet

Kind of Data	No.	Content of Data
External Standard (Fuzzy or Non-fuzzy)	B_1	Favorite of sweet
	B_2	Not favorite of sweet
Category Number (Fuzzy or Non-fuzzy Descriptive Variable)	C_1	Believing sweet good for health
	C_2	Regular intake of meal
	C_3	Intake of snacks
	C_4	Intake of late-night snack
	C_5	Favorite of vegetable
	C_6	Self-estimation of amount of vegetable intake
	C_7	Regarding sugar good for health
	C_8	Small amount of sugar for cooking
	C_9	Small amount of salt for cooking
	C_{10}	Small amount of <i>miso</i> (soybean paste) for cooking
	C_{11}	Small amount of <i>shoyu</i> (soybean source) for cooking
	C_{12}	Unbalanced diet
	C_{13}	Demand for more snacks
	C_{14}	Relatively desirable tendency of character
	C_{15}	Relatively undesirable tendency of character
	C_{16}	Desirable tendency of physical condition
	C_{17}	Undesirable tendency of physical condition
	C_{18}	Desirable tendency of psychological state
	C_{19}	Undesirable tendency of psychological state
	C_{20}	Frequency of going to private school in a week
	C_{21}	Length of stay in private school
	C_{22}	Frequency of having a cold in a year
	C_{23}	Many dental caries
	C_{24}	A door-key child?
	C_{25}	Control of meal and its time
	C_{26}	Parents' attitude regarding child

Analysis by Quantification Type II

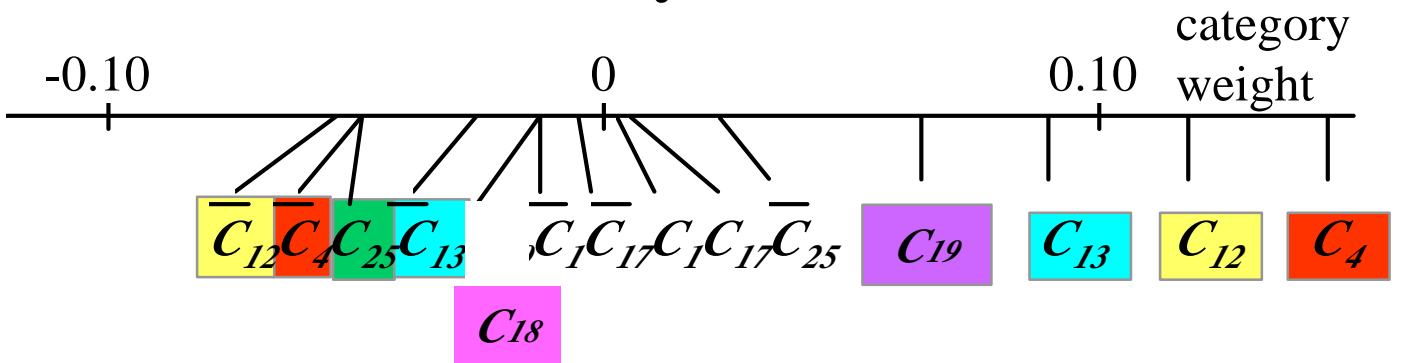
No.	Category weight		
	Fuzzy	Partially fuzzy	Non-fuzzy
C_1	0.37	0.19	0.57
C_2	0.14	0.06	0.18
C_3	-0.08	-0.16	-0.01
C_4	-0.05	-0.16	-0.04
C_5	-0.05	-0.11	-0.10
C_6	0.18	0.29	0.31
C_7	-0.07	0.04	-0.02
C_8	0.07	0.09	0.24
C_9	-0.05	0.01	0.01
C_{10}	0.06	0.16	-0.09
C_{11}	-0.07	0.05	-0.03
C_{12}	0.07	0.18	0.13
C_{13}	-0.49	-0.10	-0.07
C_{14}	0.02	0.00	0.09
C_{15}	0.17	0.44	0.09
C_{16}	-0.07	0.07	0.00
C_{17}	0.09	0.33	-0.04
C_{18}	0.20	0.17	0.19
C_{19}	-0.01	0.16	0.04
C_{20}	0.52	0.29	0.56
C_{21}	0.16	0.18	0.21
C_{22}	0.25	0.29	0.09
C_{23}	0.07	0.18	0.08
C_{24}	-0.21	0.01	-0.08
C_{25}	0.23	0.18	0.13
C_{26}	-0.03	0.32	-0.02

Type II Category weight

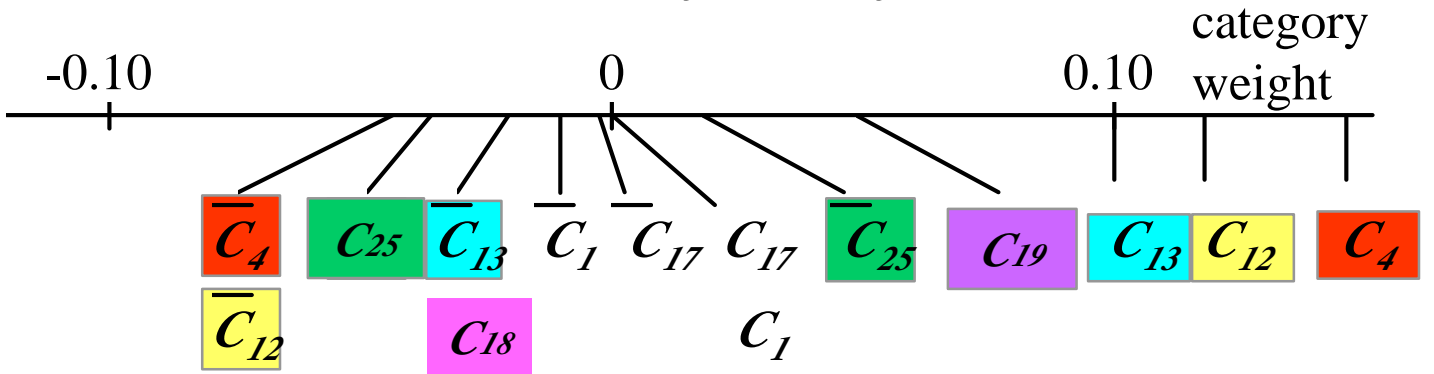
Number	Category weight		
	Fuzzy	Partially fuzzy	Non fuzzy
C_1	0.003	0.001	-0.003
$\overline{C_1}$	-0.010	-0.006	0.003
C_4	0.156	0.159	0.141
$\overline{C_4}$	-0.036	-0.037	-0.020
C_{12}	0.131	0.117	0.155
$\overline{C_{12}}$	-0.041	-0.037	-0.024
C_{13}	0.097	0.101	0.342
$\overline{C_{13}}$	-0.014	-0.014	-0.006
C_{17}	0.004	0.000	0.017
$\overline{C_{17}}$	-0.006	-0.003	-0.011
C_{18}	-0.012	-0.014	-0.004
C_{19}	0.061	0.057	0.182
C_{25}	-0.036	-0.023	-0.007
$\overline{C_{25}}$	0.019	0.011	0.000

Type III Fuzzy Group: Awareness of Sweet

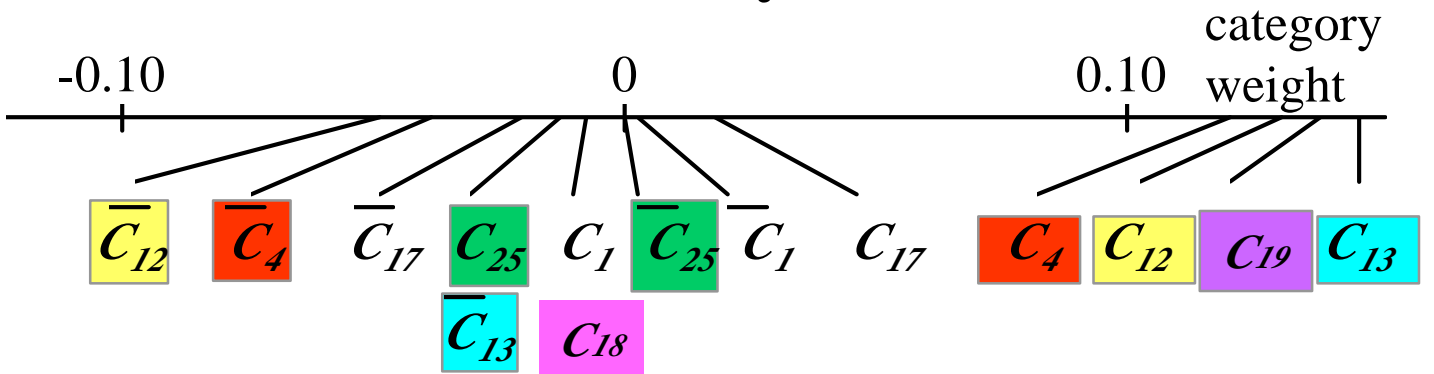
Fuzzy



Partially Fuzzy



Non-Fuzzy



Type III Fuzzy Group: Awareness of Sweet

Quantification Theory Type I

Self-estimated amount of sugar intake

Parents' attitude regarding child
Psychological stable child
Intake of late-night snack
Unbalanced diet

Coefficient of determination increased
by Fuzzy method

Child's awareness of sugar intake

C_{12} : Unbalanced diet

C_4 : Late-night snack

C_8 : Small amount of sugar for home cooking

C_1 : Sweet is thought good for health

C_{18} : Desirable tendency of psychological state

Independent on the parents' attitude regarding
child

Quantification Theory Type II

Separation of both groups: favorite and not favorite of sweet by object variable

Favarite degree is estamated by object variable directly calculated from investigation data

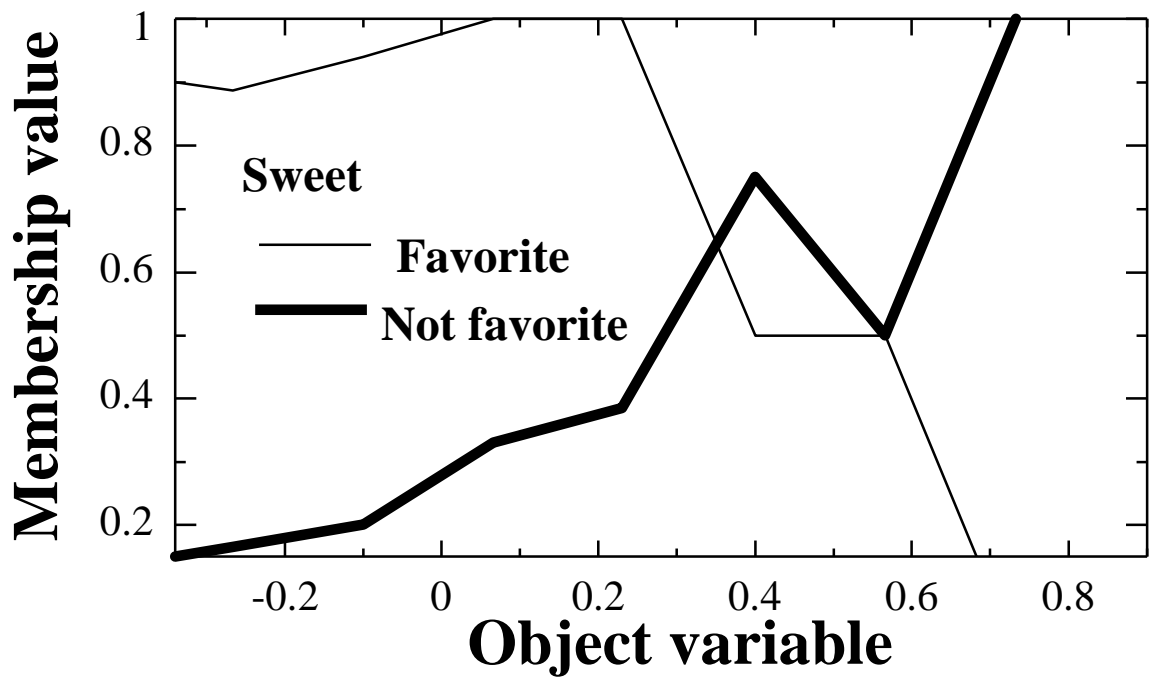
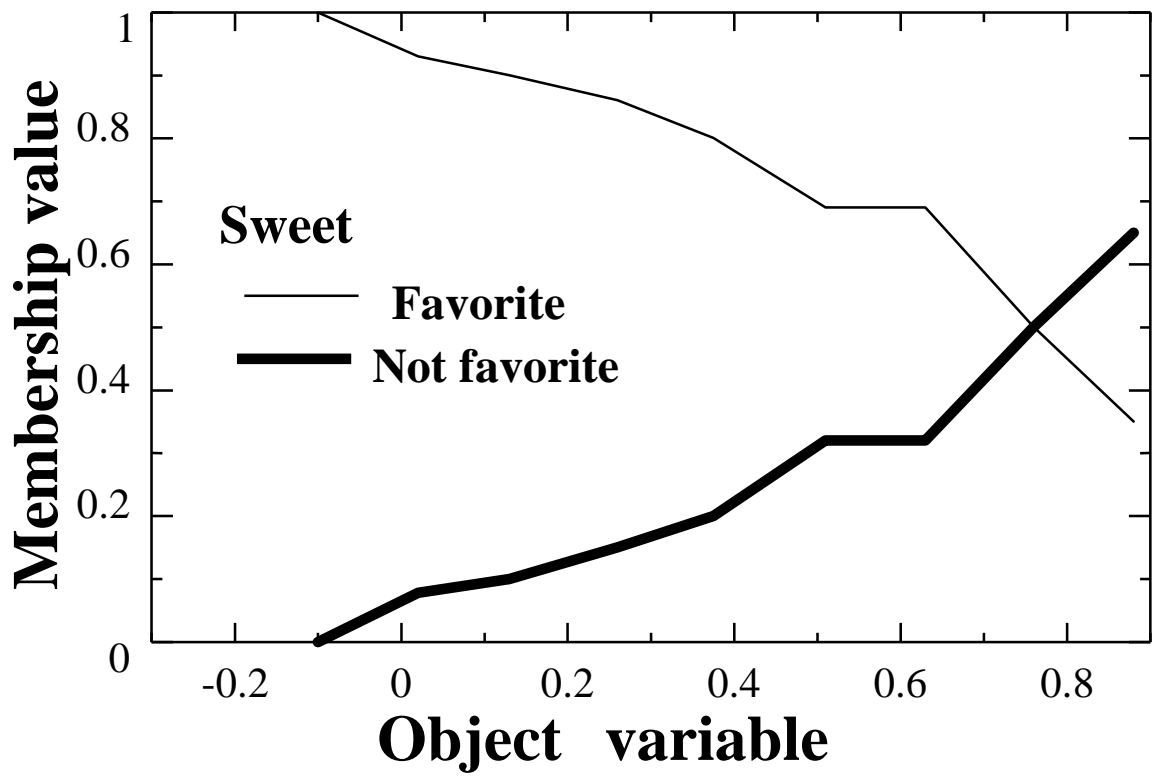
Quantification Theory Type III

Self-estimated amount of sugar intake

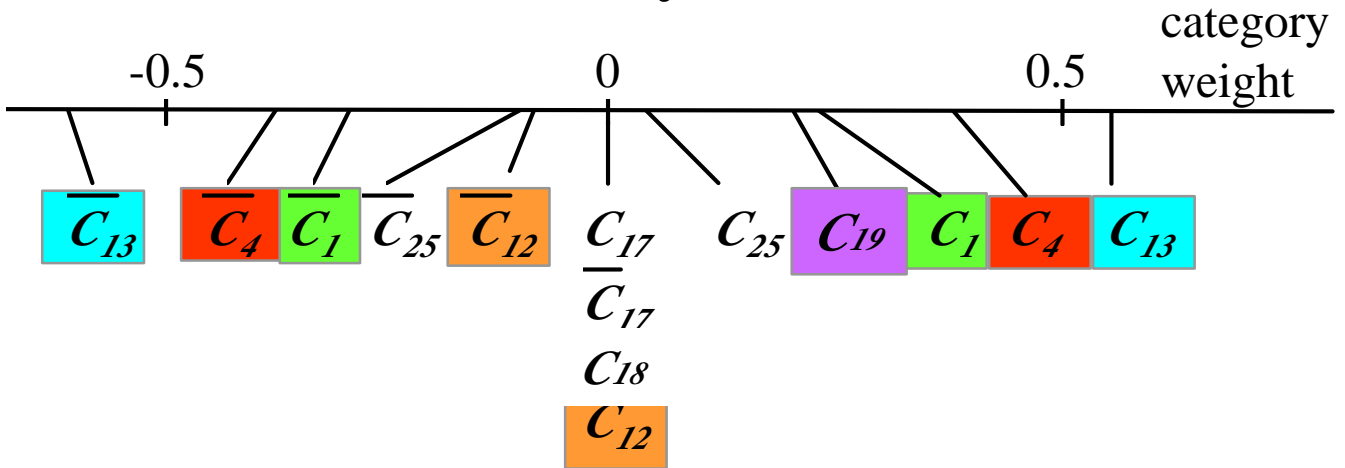
Child's Awareness of sugar intake

+direction: $C_4, C_{12}, C_{13}, C_{19}, \overline{C_{25}}$

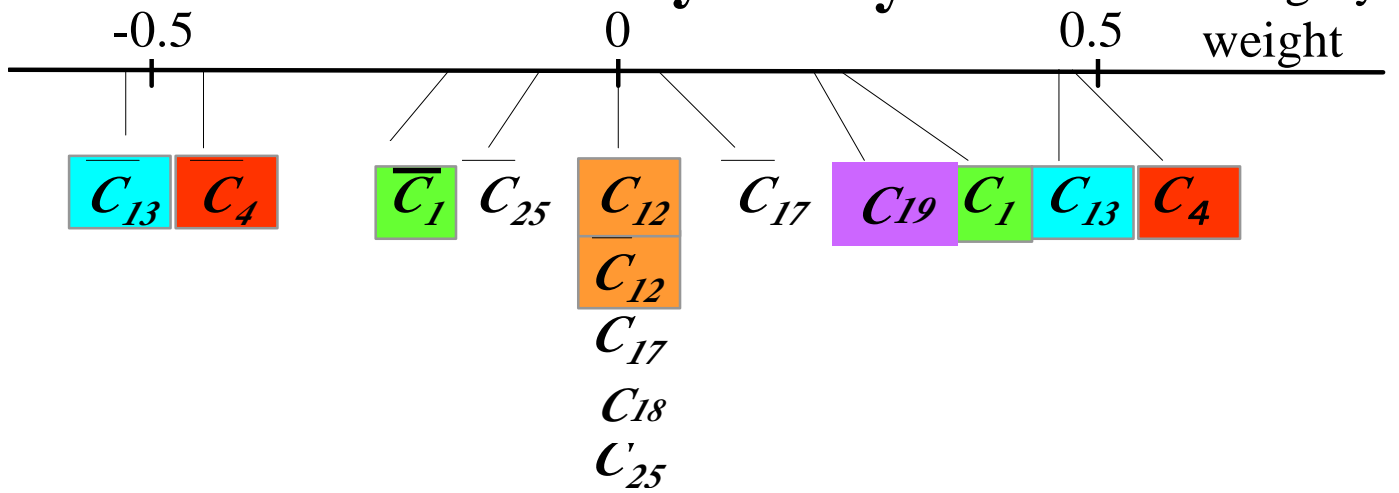
-direction: $\overline{C_4}, \overline{C_{12}}, \overline{C_{13}}, C_{18}, C_{25}$



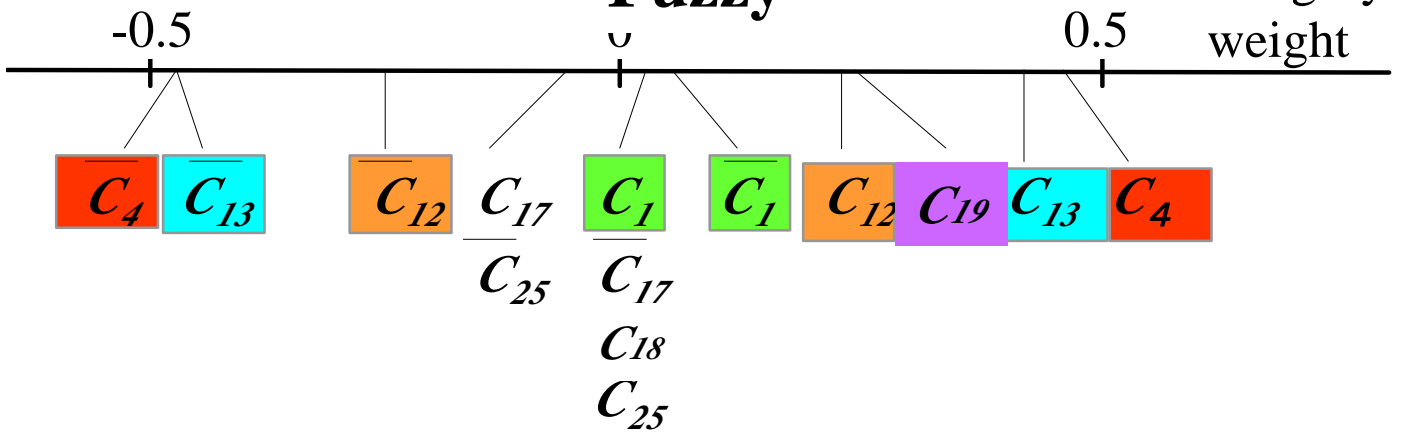
Fuzzy



Partially Fuzzy



Non-Fuzzy



Type IV Fuzzy Group: Favorite of Sweet

No.	Category weight			Partial correlation coefficient		
	Fuzzy	Partially fuzzy	Non-fuzzy	Fuzzy	Partially fuzzy	Non-fuzzy
C_1	293.25	284.91	239.04	0.31	0.27	0.24
C_2	130.55	152.55	124.02	0.23	0.29	0.38
C_3	1.44	26.64	-19.79	-0.02	0.02	0.07
C_4	239.67	234.01	133.53	0.65	0.67	0.34
C_5	39.80	77.02	126.25	0.07	0.16	0.29
C_6	-4.94	-22.21	28.44	0.05	0.13	0.10
C_7	25.05	28.94	-77.54	0.08	0.11	0.29
C_8	179.53	179.86	80.21	0.60	0.62	0.26
C_9	-35.04	-55.76	5.80	0.12	0.21	0.00
C_{10}	-90.79	-83.70	-77.21	0.30	0.30	0.27
C_{11}	29.65	30.52	40.74	0.12	0.12	0.16
C_{12}	332.23	344.04	95.52	0.69	0.75	0.21
C_{13}	132.19	32.24	-594.15	0.14	-0.01	0.53
C_{14}	25.79	102.80	-32.48	0.03	0.17	0.12
C_{15}	-118.92	-144.80	50.72	0.21	0.27	0.20
C_{16}	159.86	194.03	67.28	0.38	0.48	0.24
C_{17}	-131.23	-128.65	-18.21	0.33	0.38	0.08
C_{18}	-279.48	-342.83	-62.27	0.68	0.94	0.12
C_{19}	162.95	175.46	118.61	0.57	0.69	0.48
C_{20}	-67.57	-90.00	-2.42	0.24	0.35	0.01
C_{21}	-154.36	-159.85	-46.93	0.49	0.58	0.15
C_{22}	25.20	21.91	60.07	0.04	-0.01	0.20
C_{23}	-66.58	-55.19	-122.92	0.34	0.36	0.55
C_{24}	-120.26	-121.45	24.44	0.19	0.24	0.03
C_{25}	-188.61	-190.78	-59.24	0.69	0.82	0.23
C_{26}	7.93	-10.87	-64.34	-0.06	0.14	0.23

	Coefficient of determination			Partial correlation coefficient		
	Fuzzy	Partially fuzzy	Non-fuzzy	Fuzzy	Partially fuzzy	Non-fuzzy
	0.753	0.745	0.732	0.868	0.863	0.855

Type I Fuzzy Group: Favorite of Sweet